

ARMORERS MANUAL

FOR MAINTENANCE AND
REPAIR OF

RIFLE, 4.92 mm
ACR



HECKLER & KOCH
MARCH 1989



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ARMORERS MANUAL FOR
MAINTENANCE AND REPAIR OF

RIFLE 4,92 MM,
ACR

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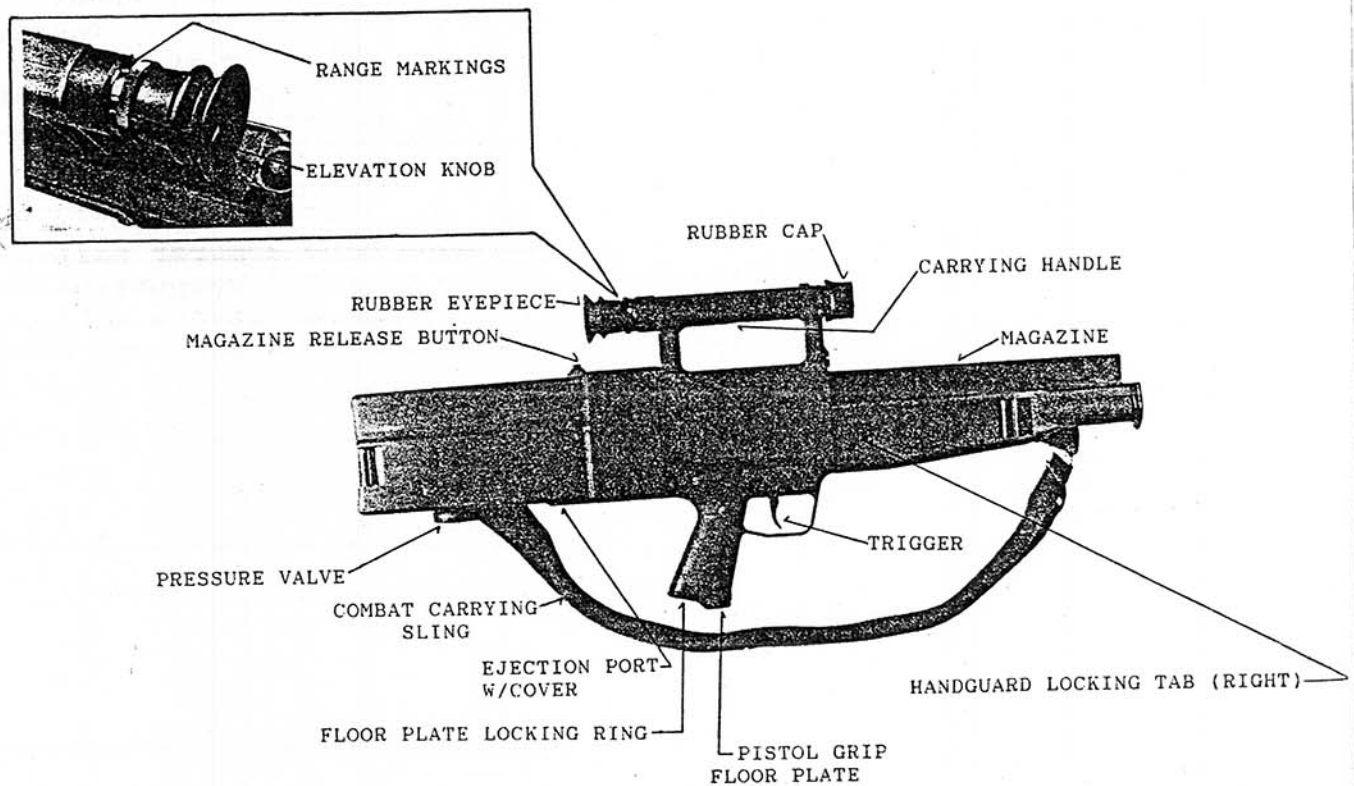
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HOW TO USE THIS MANUAL

- o This manual provides information on how to perform armorers maintenance on the HK-ACR rifle. Only properly trained and authorized personnel should attempt the detailed disassembly, inspection and repair procedures outlined in this manual.
- o Depot level maintenance, such as barrel replacement, is not covered within this manual. Any such procedure or operation not described within this manual should be considered depot level maintenance. Only the manufacturer is authorized at this time to perform any and all depot level maintenance procedures.
- o Throughout this manual, it will be necessary to describe and view parts and assemblies from six (6) different views (positions). Each view considers the position of the given item (i.e. part, assembly, group on entire weapon) in relations to the imagined position of the operation, referred to as "the operations vantage point".
- o This manual must be used in conjunction with the operators manual entitled "rifle, 4.92 mm, ACR", HK TD 2236, March 1989 produced by Heckler & Koch. The armorer must first review and understand all of the operator responsibilities as described within the operators manual before attempting to perform any task described within this armorers manual.

NOMENCLATURE OPERATING FEATURES

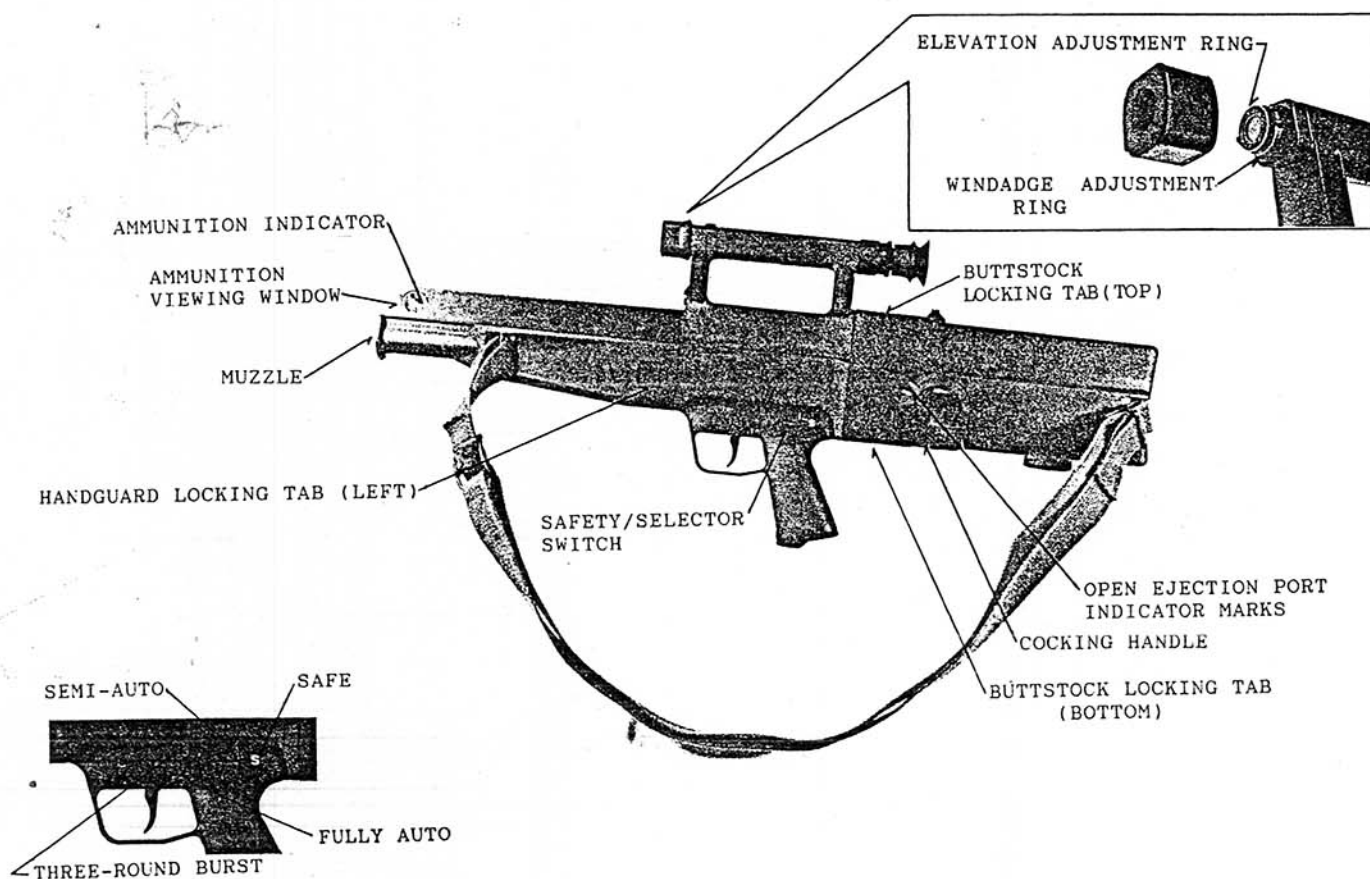
RIFLE PARTS AND WHERE THEY ARE



RIGHT SIDE VIEW

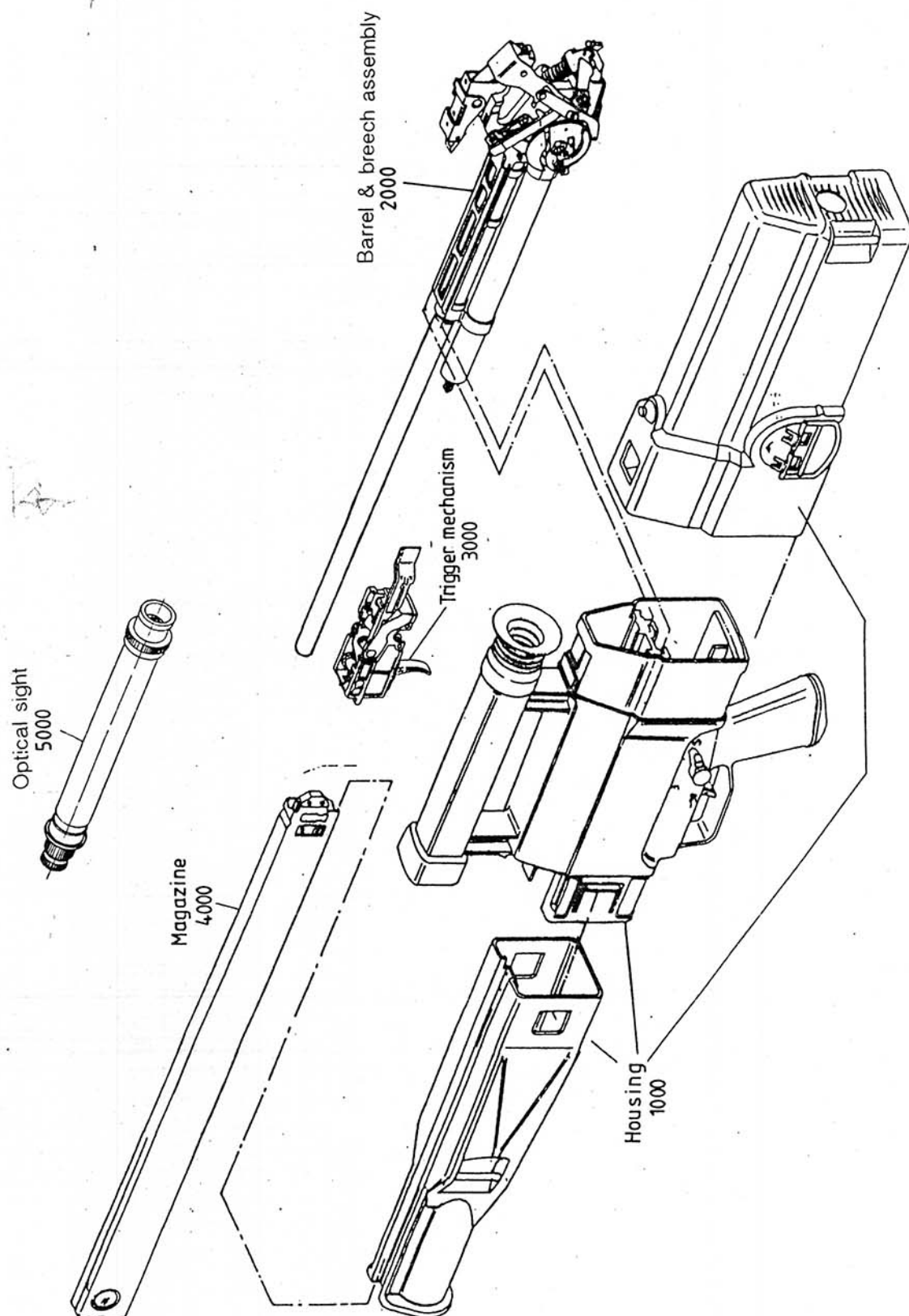
NOMENCLATURE OPERATING FEATURES (CONT)

RIFLE PARTS AND WHERE THEY ARE



LEFT SIDE VIEW

NOMENCLATURE (CONT)
5 MAJOR ASSEMBLY GROUPS



OPERATION TECHNICAL DESCRIPTION

GENERAL

The HK-ACR rifle is a light-weight, shoulder-fired, select-fire, gas-operated weapon with a rotating breech cylinder that is fed by a fifty (50) round box-type magazine, the ammunition utilized with the rifle is of a unique caseless design. The barrel, breech mechanism with counterrecoil system and much of the magazine are surrounded by an outer housing constructed from tough impact resistant material. Reliable operation of the rifle is enhanced as critical parts of the weapon are protected from mud, sand and water as well as damage due to impact. The overall styling of the HK-ACR ensures easy operation and handling in all positions and modes of fire. All operating controls can be operated by both right and left handed operators.

CENTER PART

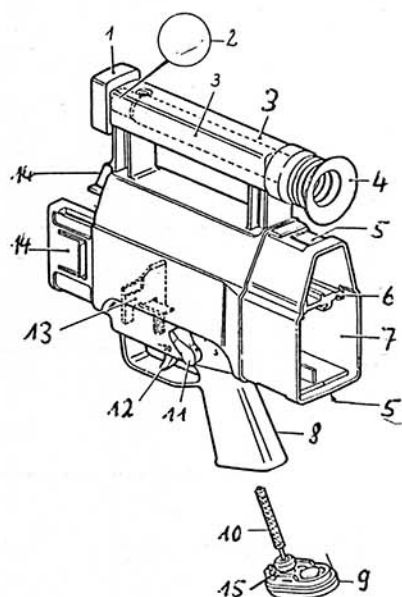
The center part contains the following features:

- o carrying handle with integral optical sight
- o center guide
- o trigger mechanism

CENTER PART WITH OPTICAL SIGHT

The center part, carrying handle, and pistol grip are all one piece. The optical sight is integrated in the carrying handle and is protected by front and rear rubber caps. The rear rubber eyepiece assures proper eye relief, eliminates glare on the rear lense and protects the operators eye during recoil. The reticle (crosshair) within the HK-ACR optical sight used for aiming is a more or less conventional intersection of a horizontal and vertical line. A stadia feature within the reticle pattern is utilized by the operation for range estimation. The sight can be adjusted for bullet drop at ranges of 400, 500 and 600 m.

OPERATION (CONT)



CENTER PART WITH OPTICAL SIGHT (LEFT VIEW)

- | | |
|----------------------------------|--------------------------------|
| 1. Rubber cap | 9. Grip floor plate |
| 2. Reticle pattern | 10. Control brush |
| 3. Carrying handle/sight housing | 11. Safety/selector switch |
| 4. Rubber eyepiece | 12. Trigger |
| 5. Locking tabs for buttstock | 13. System locking lever |
| 6. Center guide | 14. Locking tabs for handguard |
| 7. Center part | 15. Control disk wrench |
| 8. Pistol grip | |

The center guide, trigger mechanism and optical sight can all be removed from the center part as complete assemblies.

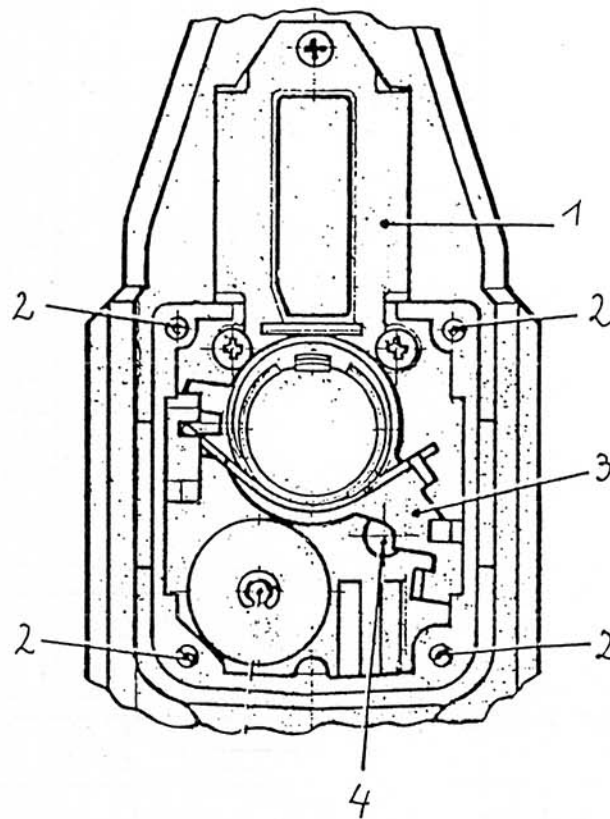
On the rear and the front of the center part are locking tabs for securing the buttstock and handguard to the center part.

Inside the center part is the system locking lever (S.L.L.). The S.L.L. holds the breech and barrel assembly in a forward position. When the trigger is pulled, the S.L.L. is moved downward allowing the breech and barrel assembly to recoil rearward. Located above the trigger mechanism is the ambidextrous safety/selector switch. Between the right and left switch, a safety/selector axle is fixed. This axle provides safe, semi-automatic, three-round burst and fully-automatic modes of fire. "Safe" and the three firing modes are indicated on both sides of the center part by painted letters. White for "safe" and red for "fire".

OPERATION (CONT)

A grip floor plate with the attached control brush are contained within the pistol grip. The control brush is inserted through the open ejection port and into the chamber to check for the presence of a round during the clearing procedure. The grip floor plate is attached to or removed from the pistol grip by rotating the locking ring 90° using slight upward pressure.

When the breech and barrel assembly (B&BA) are mounted in the center part, the front tip of the buffer rod protrudes through the hole in the front plate. The buffer rod is held in place by the spring-activated B&BA release lever, firmly connecting the B&BA to the center part.



CENTER PART, FRONT PLATE (FRONT VIEW)

1. Magazine opening (well)
2. Pressure springs
3. B&BA release lever
4. Hole for buffer rod

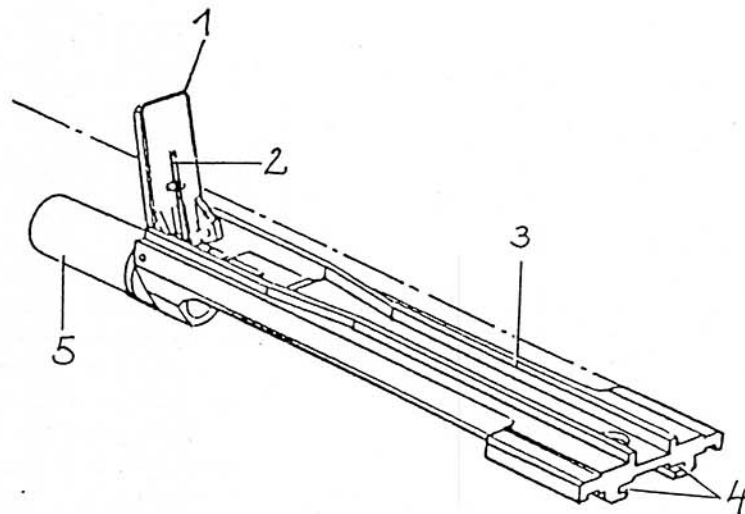
OPERATION (CONT)

The magazine opening supports the magazine within the center part. On the inside of the magazine opening is a rubber gasket, that prevents dirt and sand from entering the center part with the magazine in place. The four pressure springs exert pressure against the handguard and the locking tabs which secure it in place. In addition, these four pressure springs assist in desengaging the locking tabs when removing the handguard.

CENTER GUIDE

The center guide is held firmly in place within the center part. In turn, the center guide supports and guides the barrel and the breech assembly within the center part. As the B&BA recoil during firing, the barrel is supported by the forward cylindrical portion (bushing) of the center guide and the breech assembly is supported by the guide grooves that run parallel to and above the barrel in the center guide.

The magazine opening cover closes automatically when the magazine is removed. When inserting the magazine, the cover is pushed down into the center guide and out of the way.



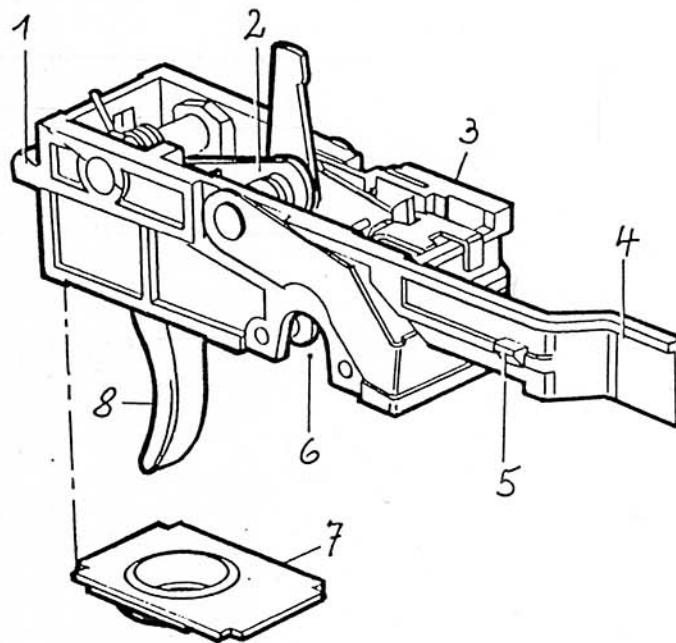
CENTER GUIDE (LEFT VIEW)

- | | |
|----------------------------------|-------------------|
| 1. Magazine opening (well) cover | 4. Guide grooves |
| 2. Elbow spring | 5. Barrel bushing |
| 3. Center guide | |

OPERATION (CONT)

TRIGGER MECHANISM

The trigger mechanism includes the housing and the internal operating parts. The trigger mechanism is fixed into the center part by the mounting tabs and the locking tab. The trigger mechanism is positioned in such a manner that the safety axle passes through the mechanism to interact with the internal parts. When the safety/selector switch is rotated from "safe" to one of the three firing modes, the trigger mechanism is free to operate. The gasket around the trigger seals the trigger mechanism to the center part.

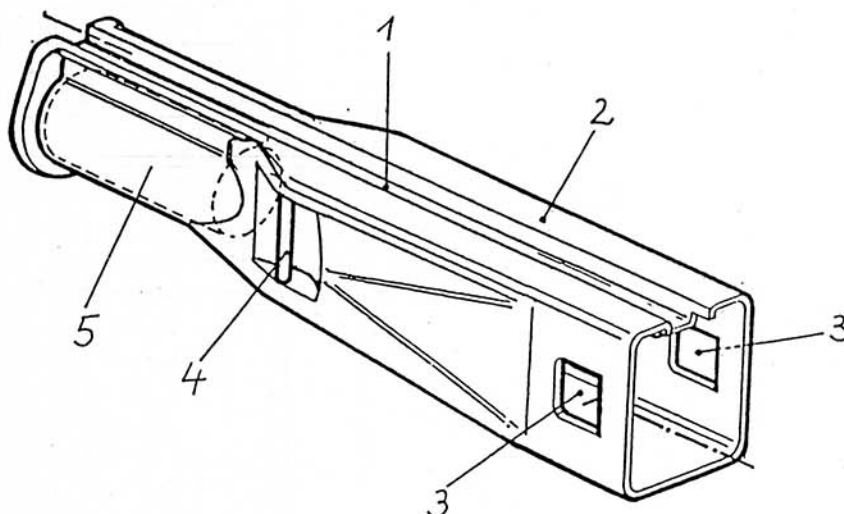


TRIGGER MECHANISM (LEFT VIEW)

- | | |
|--------------------|----------------------------|
| 1. Mounting tab | 5. Locking tab |
| 2. Internal parts | 6. Opening for safety axle |
| 3. Housing | 7. Trigger gasket |
| 4. Mounting handle | 8. Trigger |

The handguard is attached to the center part below the barrel. It is secured to the center part by the two locking tabs that engage in the windows located in the handguard. A cylindrical metal heatshield is incorporated into the front of the handguard and shields the handguard and the operations hand from heat radiating from the barrel during firing. Sling attachment points are located on both sides of the handguard so that the carrying sling can be mounted on both sides of the weapon for right and left hand use. The guide groove aligns the magazine with the center part.

OPERATION (CONT)



HAND GUARD (LEFT VIEW)

- | | |
|------------------------------|---------------------------|
| 1. Guide groove for magazine | 4. Sling attachment point |
| 2. Locking tab window | 5. Heat shield |

BUTTSTOCK

The buttstock is pushed forward to mount it on the center part. Two locking tabs engage with locking tab windows to hold the buttstock securely in place on the center part. The gasket positioned within the buttstock seals the joint of the buttstock and the center part when they are assembled.

By pressing down on the magazine release button, the magazine catch located on the B&BA is actuated. This action disengages the magazine from the B&BA so that it may be withdrawn from the weapon. The magazine release button is sealed to the buttstock by a rubber cap. At the rear end of the buttstock there are sling attachment points on both left and right sides.

OPERATION (CONT)

The cocking handle is located on the left side of the buttstock. It consists the following parts:

- o cover
- o cocking handle
- o toothed wheels
- o ejection port

The cocking mechanism is required to:

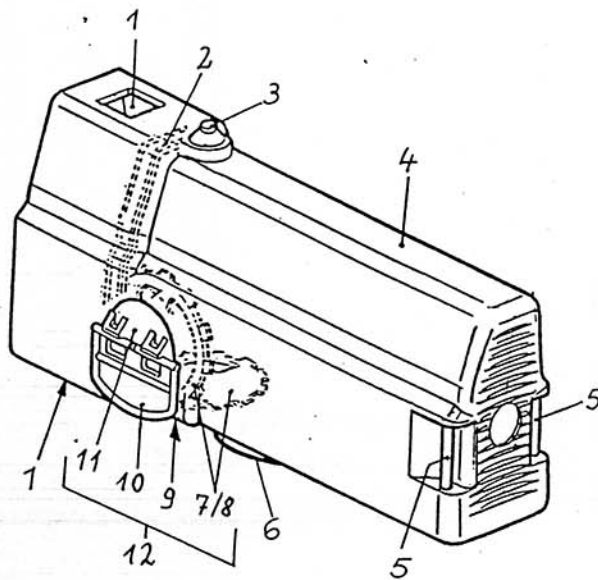
- o chamber a round
- o cock the firing mechanism
- o to unload an already chambered round from the chamber

The cocking handle has to be unfolded away from the body of the buttstock and rotated 360° in a counter clockwise direction (in accordance with the white arrow) until a notilable stop is felt. Then a short reverse (clockwise) rotation of the cocking handle to "unlock" the handle in advance for the next rotation. The handle is then folded back against the buttstock. The rotations of the cocking handle accomplishes the following actions:

- o with a loaded magazine is place, a single round will be chambered
- o the firing mechanism is cocked
- o without a magazine in place, the last loaded round is ejected from the weapon
- o the ejection port located on the bottom side of the buttstock is momentarily opened to allow a chambered round to exit the weapon.

The high pressure vent on the bottom of the buttstock prevents the build-up of high-pressure propellant gas within the tightly-sealed outer housing on which it is fixed.

OPERATION (CONT)



BUTTSTOCK (LEFT VIEW)

- | | |
|----------------------------|-----------------------------|
| 1. Locking tab windows | 7. Sealing wheel |
| 2. Gasket | 8. Toothed wheel |
| 3. Magazine release button | 9. Ejection port |
| 4. Buttstock | 10. Cocking handle |
| 5. Sling attachment points | 11. Cover |
| 6. High pressure vent | 12. Cocking mechanism, cpl. |

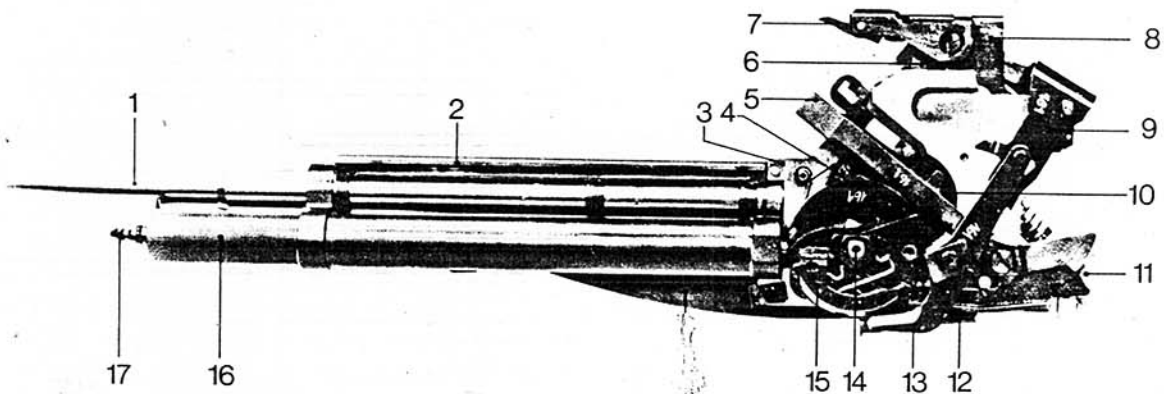
BREECH AND BARREL ASSEMBLY (B&BA)

The breech cylinder housing, barrel, counter recoil mechanism, and gas system are one complete assembly. The barrel has four lands and grooves with a constant right hand cylinder housing and fixed by two solid holding pins. The guide rail is fixed on top of the barrel. The guide rail guides the B&BA along the center guide.

The counter recoil mechanism is also attached to the b&ba by a holding pin. A band supports the front of the counter recoil mechanism to and below the barrel. The groove in the end of the buffer extension engages with the B&BA release lever located in the front of the center part.

The control disk is turned by the toothed axle of the actuator gear. The control lever is actuated by the camming groove in the control disk.

OPERATION (CONT)



BARREL & BREECH ASSEMBLY (LEFT SIDE VIEW)

- | | |
|----------------------------|------------------------------|
| 1. Barrel | 10. Breech cylinder |
| 2. Guide rail | 11. Clamping plate |
| 3. Breech cylinder housing | 12. Stop lever |
| 4. Cylinder stop lever | 13. Control lever |
| 5. Catch | 14. Actuator axle |
| 6. Ejector | 15. Control disk |
| 7. Magazine catch | 16. Counter recoil mechanism |
| 8. Guide housing | 17. Buffer extension |
| 9. Ejector lever | |

CONTROL DISK

If a magazine is inserted, the function of the control lever does not occur. If there is no magazine in place, the control lever actuates the ejector lever during manual cocking. The ejector lever in turn pushes the ejector into the chamber to eject an already chambered round. If a round is not present in the chamber, the ejector passes ineffectually through the chamber.

In addition, the control disk also operates the cylinder stop lever. By this action, the chamber is positioned in either the firing (horizontal) or feeding/ejection (vertical) position. Furthermore, the control disk stops the movement of the chamber as soon as it is in firing position. This is accomplished by the engagement of the stop lever and the control disk.

OPERATION (CONT)

The catch holds the breech cylinder in the breech cylinder housing, the catch must be disengaged and moved clockwise into it's unlocked position (approximatly at 11 o'clock). With this movement the rear portion of the catch presses down on the clamping plate and the firing pin is locked in a cocked position.

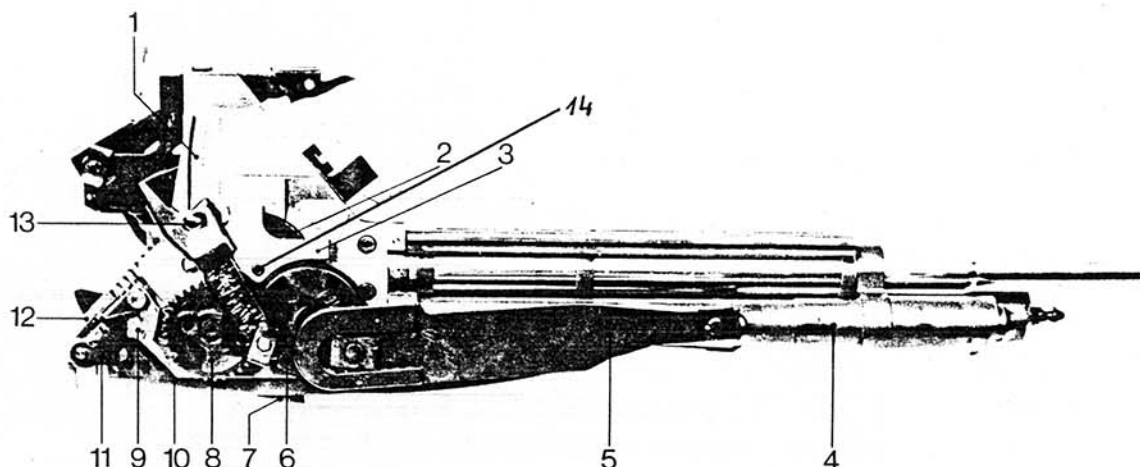
The magazine catch engages with the notch on the magazine housing when it is fully inserted into the weapon.

The breech cylinder is supported on the right side where the axle of the breech cylinder passes through the supporting arm of the breech cylinder housing.

The connecting rod connects the gas system with the actuator gear. The gas system propels the connecting rod back and forth. This movement is converted into a circular motion due to the connection of the connecting rod and the circular actuator gear (similar to the arrangement on the drive wheel of a steam locomotive). The circular motion is transferred by teeth to the neighboring spur gear which is connected to the feeding lever. The feeding lever is propelled upwards through the feeding groove. During this upward movement, the angle of the feeding groove moves the top of feeding lever over the top of the first round in the magazine. At the apex of the feeding levers climb, it automatically moves downward to push the cartridge from the magazine into the chamber.

The slide prevents the round being fed into the chamber from passing all the way through the chamber. The slide allows for precise positioning of the chambered round within the chamber. The slide is pushed rearward by the lower sealing wheel in the buttstock when the cocking handle is rotated which allows the chambered round to be pushed through the open ejection port.

OPERATION (CONT)

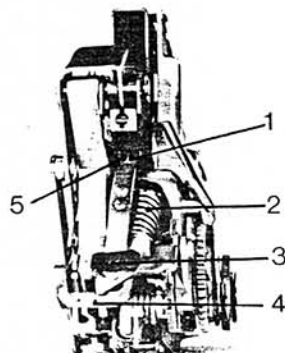


BREECH AND BARREL ASSEMBLY (RIGHT SIDE VIEW)

- | | |
|-------------------------------------|--------------------------|
| 1. Feeding groove | 8. Spur gear |
| 2. Breech cylinder | 9. Actuating lever |
| 3. Support for breech cylinder axle | 10. Slide |
| 4. Gas cylinder | 11. Disconnecter |
| 5. Connecting rod | 12. Clamping plate |
| 6. Actuating gear | 13. Feeding lever |
| 7. Sear | 14. Breech cylinder axle |

The camming surface located on the underside of the spur gear activates the actuating lever which in turn pushes downward on the clamping plate. The downward movement of the clamping plate compresses the compression spring and at the same time places the firing pin in a cocked position.

The disconnecter keeps the clamping plate in a cocked position. The disconnecter is moved downward by the sear which releases the clamping plate. With the release of the clamping plate, the striker rotates the firing pin to strike the primer.



BREECH AND BARREL ASSEMBLY
(VIEW FROM THE REAR)

- | |
|-----------------------|
| 1. Striker |
| 2. Compression spring |
| 3. Axle |
| 4. Clamping plate |
| 5. Firing pin |

OPERATION (CONT)

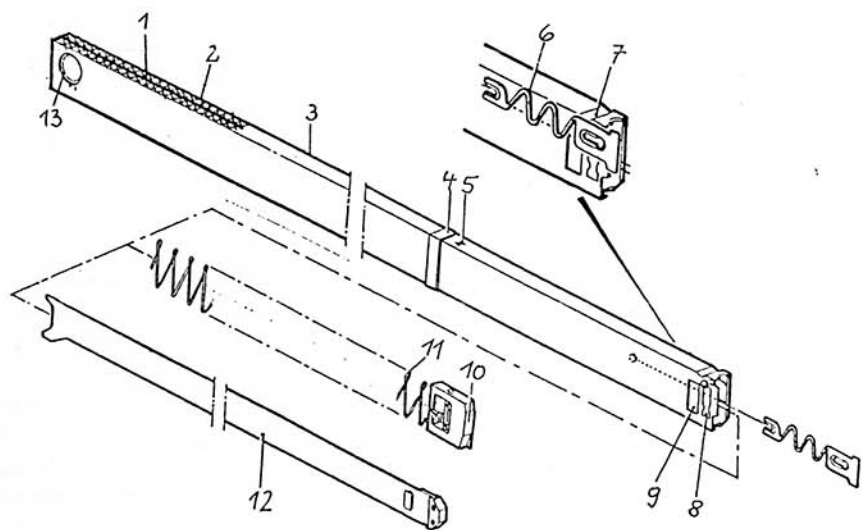
MAGAZINE

The single-row magazine is inserted into the HK-ACR above the barrel and parallel to it. It's capacity is fifty (50) rounds. To remove it from the weapon, it must be withdrawn in the direction of the muzzle (forward) after the magazine release button is depressed.

Near the open end of the magazine, there is a white ammunition symbol visible. This symbol indicates the proper position for loading rounds into the magazine.

On the top side of the magazine there is a white reference line that runs parallel with the barrel. This line indicates the top of the magazine to facilitate correct loading and can be used as an aiming aid when firing the weapon from the hip.

A circular transparent ammunition indicator window is positioned on the left side of the magazine near the front. This window allows the operator to see the position of a single red coil of the magazine spring. The position of this red "line" indicates the approximate number of rounds present in the magazine.



MAGAZINE (LEFT SIDE VIEW)

- | | |
|---------------------------------------|------------------------------------|
| 1. Indicator line | 6. Stop bar tab window |
| 2. Housing | 7. Follower |
| 3. Plastic spring | 8. Follower spring |
| 4. Magazine catch notch | 9. Stop bar |
| 5. Ammunition symbol
(not visible) | 10. Ammunition indicator
window |
| | 11. Stop bar tab |

OPERATION (CONT)

In the magazine housing there are the following parts:

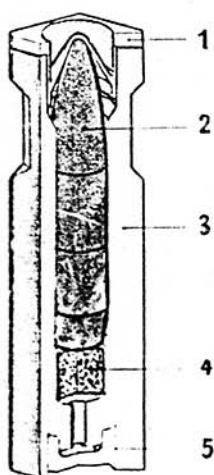
- o follower spring
- o follower
- o stop bar
- o plastic spring

The follower is connected to the follower spring. This spring pushes the rounds into feeding position.

The stop bar is precisely positioned within the magazine housing by the engagement of the stop bar tab within the stop bar window. A spring actuated lever located within the follower engages with serrations on the stop bar to prevent movement of the follower in the opposite direction of feeding. This action ensures that all subsequent rounds are always in a proper feeding position at the mouth of the magazine.

CARTRIDGE

The cartridge (round) is caseless. That means that the propellant is pressed together into a four-cornered (retangular) propellant body. No metallic materials are required to contain the propellant (powder) as in conventional cased ammunition. The projectile (bullet) is completely surrounded by the propellant body and is protected by a plastic cap. For ignition, an impact sensitive primer positioned in the bottom of the propellant body ignites a booster positioned below the projectile.



CARTRIDGE

- 1. Plastic cap
- 2. Projectile
- 3. Propellant body
- 4. Booster
- 5. Primer

The firing pin strikes the primer to begin the ignition sequence. The primer in turn ignites the booster which ignites the propellant. The bullet is pushed through the plastic cap into and through the barrel. The plastic cap exits the barrel behind the bullet.

PRINCIPLE OF OPERATION (CONT)

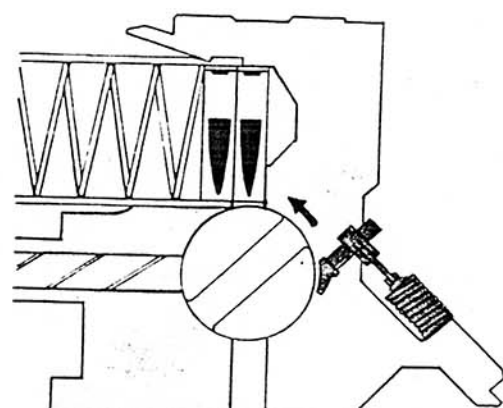
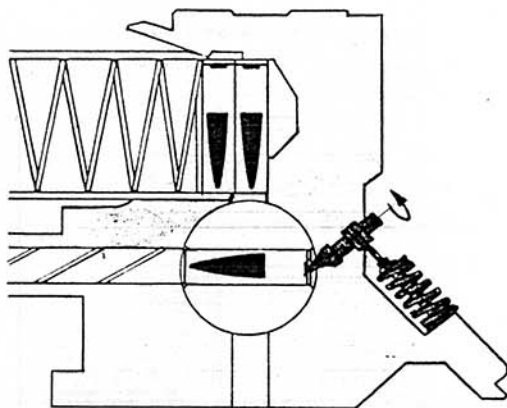


Figure #2

ROTATING BREECH
CYLINDER AND CHAMBER
IN FIRING POSITION

BREECH CYLINDER AND
CHAMBER ROTATING BACK
INTO THE FEEDING POSITION

After the round is fired, the breech cylinder is turned by the feeding and firing mechanism counter clockwise into feeding position. The next round is chambered and the breech cylinder is moved back into firing position.

TRIGGER MECHANISM

When the trigger is pulled, the lower extension of the system locking latch is pushed rearward by the roller. At the same time, the front extension of the system locking latch makes contact with and pushes down on the system locking lever. Now the breech and barrel assembly (B&BA) is free to recoil rearward. Simultaneously, the latch is moved forward by the system locking latch and allows the spring actuated drop safety to move forward and disengage from the sear.

N O T E :

THE SEAR CAN NOT MOVE UNTIL THE DROP SAFETY BREAKS CONTACT WITH IT. THIS PREVENTS THE WEAPON FROM FIRING UNLESS THE TRIGGER IS PULLED.

PRINCIPLE OF OPERATION (CONT)

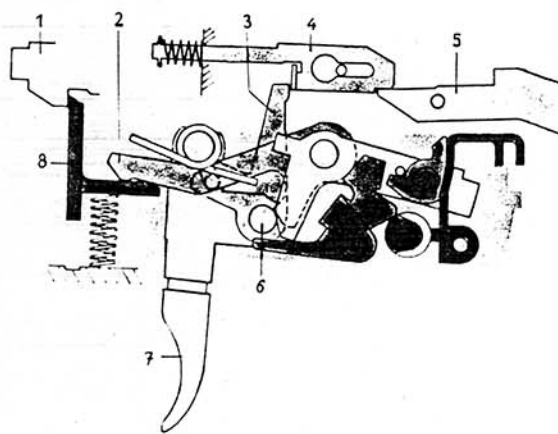


Figure #3

TRIGGER MECHNISM. SAFETY AXLE IN SINGLE-FIRE POSITION

- | | |
|---------------------------|-------------------------|
| 1. Breech barrel assembly | 5. Sear |
| 2. System locking latch | 6. Roller |
| 3. Latch | 7. Trigger |
| 4. Drop safety | 8. System locking lever |

The release lever is pushed rearward by the roller when the trigger is pulled. Through this action, the release latch moves upwards and pushes the front of the sear up which releases the cocked firing pin. The firing pin, in turn, fires the chambered round.

PRINCIPLE OF OPERATION (CONT)

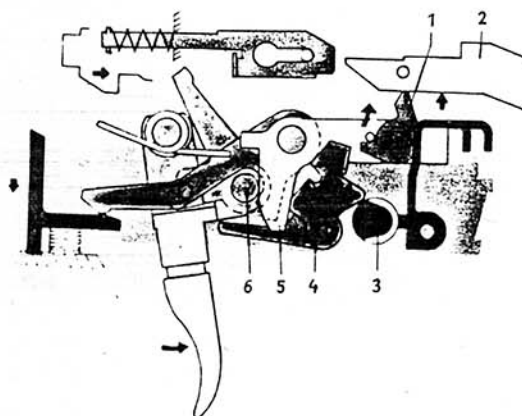


Figure #4

TRIGGER MECHANISM. SAFETY AXLE IN
SINGLE-FIRE POSITION. TRIGGER PULLED

- | | |
|------------------|------------------|
| 1. Release latch | 4. Support lever |
| 2. Sear | 5. Release lever |
| 3. Safety axle | 6. Roller |

SINGLE-FIRE

In single-fire, the safety axle prevents the support lever from moving. The B&BA is held in forward position by the counter recoil mechanism. If the trigger is released, the B&BA is fixed by the system locking lever and the trigger is moved forward into rest position.

PRINCIPLE OF OPERATION (CONT.)

THREE-ROUND BURST

When firing a three-round burst, the control slide is moved to the left by a camming surface of the safety axle. In this position the support lever can no longer block the movement of the release latch.

When the trigger is pulled, the catch is now pushed upwards by the release latch instead of the sear (as occurred in single-fire). The movement of the catch activated the three-round counting mechanism. The first round of the burst is fired as in single-fire but the remaining rounds of the burst are automatically fired by command from the three-round counting mechanism. The burst is automatically stopped after the third round is fired. After the last round of the burst is fired, the B&BA moves forward over the release latch and into its most forward position.

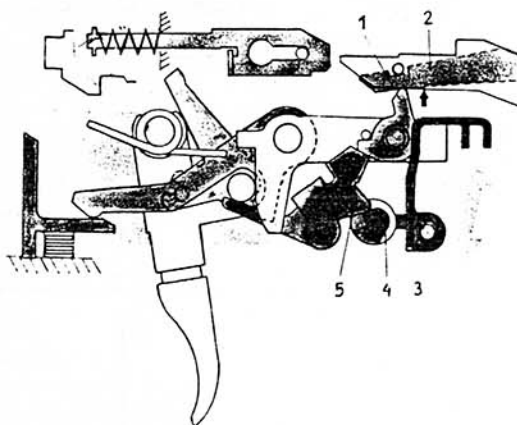


Figure #5

TRIGGER MECHANISM. SAFETY AXLE IN
THREE-ROUND BURST POSITION, TRIGGER PULLED

- | | |
|------------------|------------------|
| 1. Release latch | 4. Safety axle |
| 2. Catch | 5. Support lever |
| 3. Control slide | |

PRINCIPLE OF OPERATION (CONT)

SUSTAINED-FIRE

While on sustained-fire, the support lever is pushed rearward by the trigger and holds the release latch in a fixed (stationary) position. After a round is fired and as the B&BA moves forward, the sear makes contact with the fixed immobile release latch. This contact drives the sear upwards which will automatically release the firing pin to fire the next round. This sequence is repeated as long as the trigger is depressed and the magazine has rounds in it.

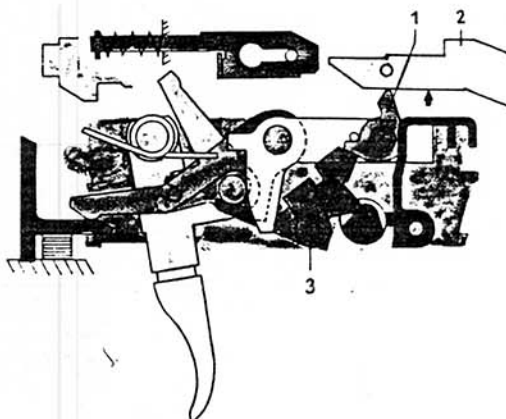


Figure #6

TRIGGER MECHANISM. SAFETY AXLE IN
SUSTAINED FIRE POSITION, TRIGGER PULLED

PRINCIPLE OF OPERATION (CONT)

TRIGGER/FIRING PIN SYSTEM (LOCK-WORK)

When the trigger is pulled, the latch moves forward and allows the pressure spring to push the drop safety forward and out of engagement with the sear. The release latch pushes the front of the sear upwards which in turn pulls the disconnecter. The firing pin is rotated by the stored energy in the compression spring and ignites the chambered round.

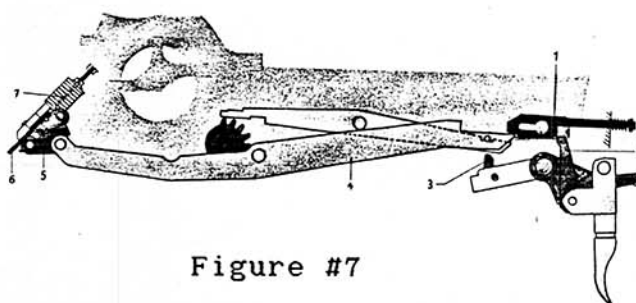


Figure #7

TRIGGER/FIRING PIN SYSTEM. CLAMPING PLATE AND FIRING PIN COCKED.

- | | |
|------------------|-----------------------|
| 1. Drop safety | 5. Disconnector |
| 2. Latch | 6. Clamping plate |
| 3. Release latch | 7. Compression spring |
| 4. Sear | |

After firing, the rotation of the breech cylinder recocks the clamping plate by pushing the clamping plate rearward until the disconnecter can engage the clamping plate. The compression spring is now compressed again and the sear is in ready position. During sustained fire with the trigger pulled the drop safety remains forward and disengaged from the sear thus allowing the sear to be automatically forced upwards through contact with the release latch as the B&BA moves forward after firing.

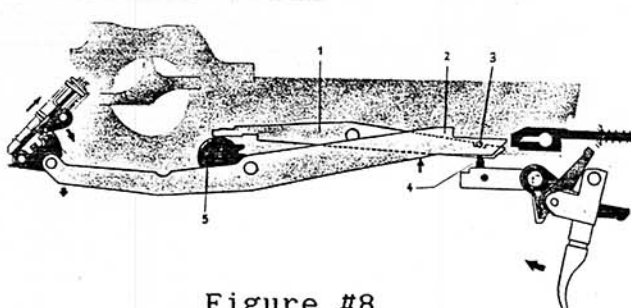


Figure #8

TRIGGER/FIRING PIN SYSTEM. CLAMPING PLATE AND FIRING PIN RELEASED

- | | |
|-------------------|-------------------------------|
| 1. Catch | 4. Release latch |
| 2. Sear | 5. Three-round counting wheel |
| 3. Engagement pin | |

PRINCIPLE OF OPERATION (CONT)

To begin a three-round burst, the release latch is moved to the left by the rotation of the safety axle. In this position, the release latch will push upwards on the catch when the trigger is pulled. The catch in turn pushes upwards on the sear via the engagement pin which is attached to the sear. This action will cause a chamber round to be ignited by the firing pin. At the same time that the sear releases the firing pin, the rear end of the catch activates the three-round counting mechanism which interrupts the burst automatically after the third round is fired.

BREECH CYLINDER DRIVE SYSTEM

N O T E :

IN THE STARTING POSITION THE CLAMPING PLATE IS COCKED AND THE SAFETY/SELECTOR SWITCH IS SET ON ONE OF THE THREE "FIRE" POSITIONS.

After the round is ignited by release of the firing pin, the projectile gases through the bore. In the forward portion of the barrel a gas port is positioned to vent gas into the gas system from the bore. After the projectile has passed this port, gas flows into the gas cylinder and forces the gas piston rearward against the return spring. The connecting rod, which is fixed to the piston, is pushed rearward transferring this rearward movement to the rotating motion of the actuator gear.

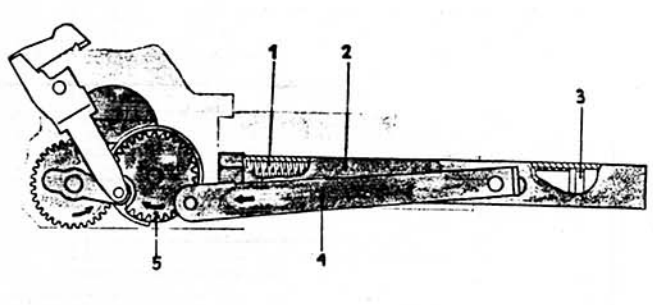


Figure #9

GAS SYSTEM WITH CONNECTING ROD AND ACTUATING GEAR

- | | |
|------------------|-------------------|
| 1. Return spring | 4. Connecting rod |
| 2. Gas cylinder | 5. Actuating gear |
| 3. Gas piston | |

PRINCIPLE OF OPERATION (CONT)

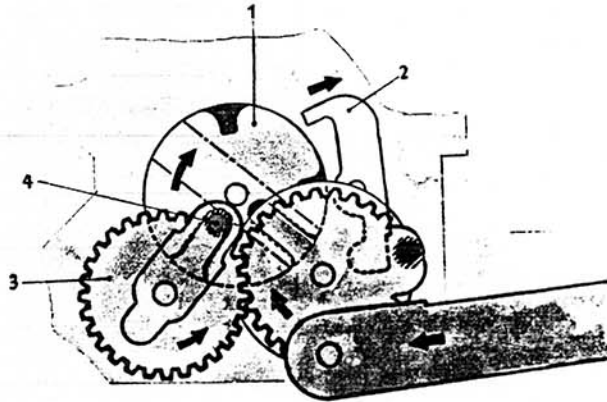


Figure #11

BREECH CYLINDER 45° BETWEEN FIRING AND FEEDING POSITION

- | | |
|------------------------|-------------------|
| 1. Breech cylinder | 3. Spur gear |
| 2. Cylinder stop lever | 4. Camming bolt A |

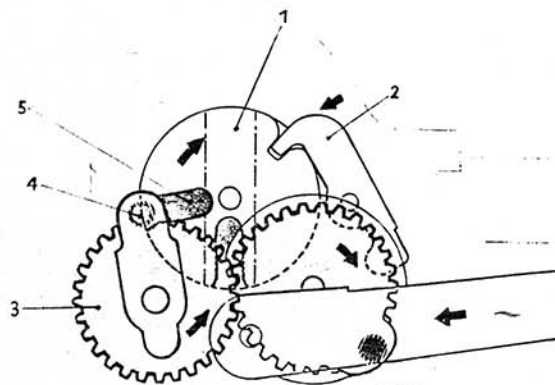


Figure #12

BREECH CYLINDER IN FEEDING (VERTICAL) POSITION

- | | |
|------------------------|---------------------|
| 1. Breech cylinder | 4. Camming bolt A |
| 2. Cylinder stop lever | 5. Camming groove A |
| 3. Spur gear | |

PRINCIPLE OF OPERATION (CONT)

After the actuating gear has rotated the breech cylinder 90° into feeding position "Camming bolt A" disengages from "Camming groove A" located on the breech cylinder. The breech cylinder is now in feeding (vertical) position and is held in this position by the cylinder stop lever (see figure #12).

The round is fed into the chamber after which the control disk (not pictured) causes the cylinder stop lever to disengage from the breech cylinder. "Camming bolt B", located on the actuating gear, enters "Camming groove B" and turns the breech cylinder counter clockwise 90° into firing (horizontal) position (see figure #13 below).

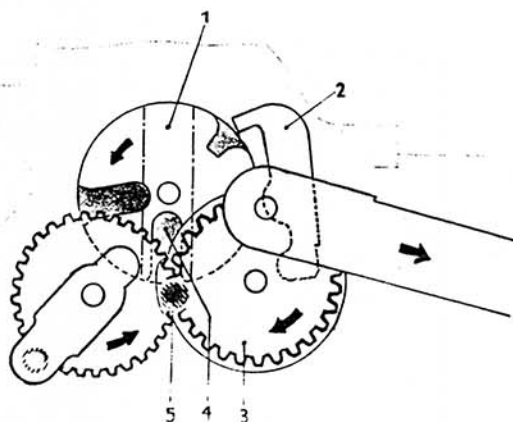


Figure #13

BREECH CYLINDER RETURNING TO FIRING POSITION

- | | |
|------------------------|---------------------|
| 1. Breech cylinder | 3. Actuating gear |
| 2. Cylinder stop lever | 4. Camming groove B |
| | 5. Camming bolt B |

FEEDING

N O T E :

IN THE STARRING POSITION, THE BREECH CYLINDER IS IN FIRING POSITION, CHAMBER HORIZONTAL.

The feeding lever is connected to the spur gear. The feeding lever is guided through the feeding groove by a round bolt attached to the feeding lever.

PRINCIPLE OF OPERATION (CONT)

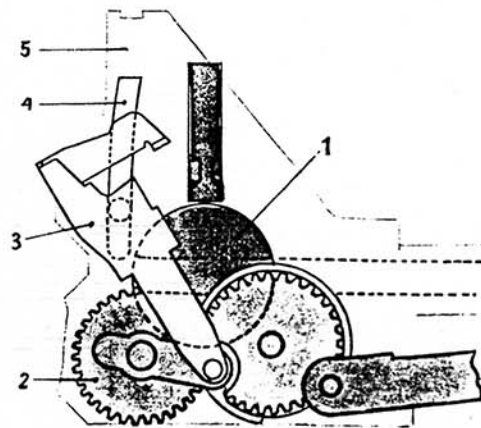


Figure #14

FEEDING SEQUENCE IN STARTING POSITION,
BREECH CYLINDER IN FIRING POSITION

- 1. Breech cylinder
- 2. Spur gear
- 3. Feeding lever

- 4. Feeding groove
- 5. Breech cylinder housing

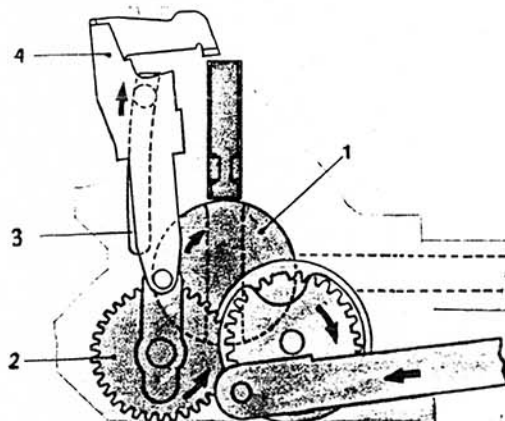


Figure #15

FEEDING LEVER AT APEX OF CLIMB, BREECH
CYLINDER IN FEEDING POSITION

- 1. Breech cylinder
- 2. Spur gear

- 3. Feeding groove
- 4. Feeding lever

PRINCIPLE OF OPERATION (CONT)

The same moment that the spur gear moves the breech cylinder into feeding position, the feeding lever is moved to it's highest position over top of the first round in the magazine. As the spur gear continues to rotate it draws the feeding lever downward through the feeding groove. The feeding lever draws with it a round and pushes it into the waiting chamber. Once the round is completely chambered, the feeding lever is moved backwards and out of contact with the round. At the same time, the cylinder stop lever is desengaged from the breech cylinder thus permitting the breech cylinder to move. The breech cylinder is rotated by the actuating gear 90° counter clockwise into firing position.

PRINCIPLE OF OPERATION (CONT)

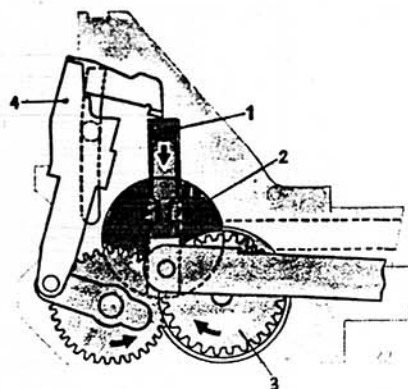


Figure #16

FEEDING LEVER AND BREECH CYLINDER IN FEEDING POSITION

- | | |
|--------------------|-------------------|
| 1. Round | 3. Actuating gear |
| 2. Breech cylinder | 4. Feeding lever |

COUNTER RECOIL MECHANISM

The B&BA is free to move horizontally back and forth in the center part by sliding on the center guide. The counter recoil mechanism is fixed to the breech cylinder by a pin and to the barrel by the barrel band.

The front of the buffer extension is locked into the front plate of the center part and the rear of the extension is fixed within the body of the buffer (see figure #17).

When a round is fired, the B&BA is pushed rearward by the recoil impulse. This movement draws rearward the counter recoil mechanism though the buffer remains stationary and fixed to the front plate of the center part. Due to this rearward movement of the B&BA, the buffer spring is compressed within the buffer housing.

PRINCIPLE OF OPERATION (CONT)

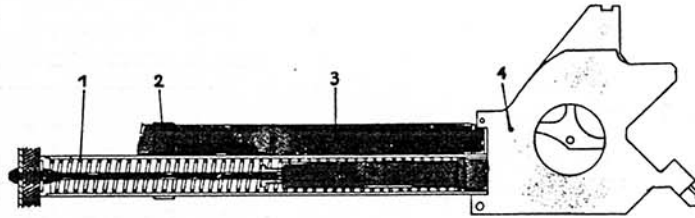


Figure #17

BUFFER AT REST POSITION, B&BA FORWARD

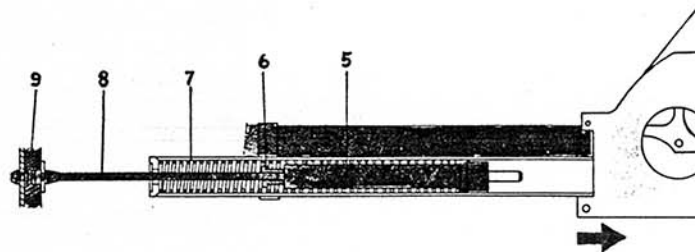


Figure #18

BUFFER POSITION DURING SINGLE AND SUSTAINED FIRE

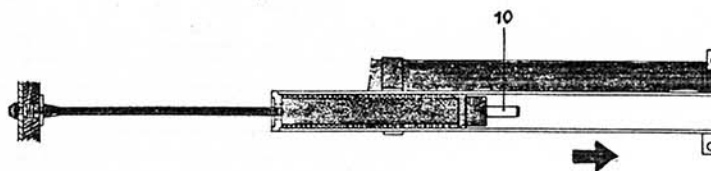


Figure #19

BUFFER POSITION AFTER LAST ROUND OF THREE-ROUND BURST
COUNTER RECOIL MECHANISM

- | | |
|----------------------------|---------------------|
| 1. Buffer spring | 6. Return buffer |
| 2. Barrel band | 7. Buffer housing |
| 3. Barrel | 8. Buffer extension |
| 4. Breech cylinder housing | 9. Front plate |
| 5. Buffer | 10. Buffer rod |

PRINCIPLE OF OPERATION (CONT)

The rearward movement of the B&BA during recoil in single and sustained fire is ended after 50 mm (2") of travel. The buffer spring dampens the recoil movement and pushes the B&BA forward into it's rest position (see figures #17 & #18). The buffer rod slows and controls the final forward movement of the B&BA as it comes to rest back into it's forward position.

In three-round burst mode, the B&BA has moved rearward approximately 110 mm (4 ³/₈") after the last round is fired. To prevent damage to the counter recoil mechanism, the return buffer acts to dampen the impact of the front of the buffer against the buffer housing (see figure #19). As the return buffer strikes the front of the buffer housing, the braking effect of the hydraulic buffer ceases.

FEEDING

The ejector is pushed rearward by the first round in the magazine. When the cocking mechanism is manually operated, a chambered round is ejected from the chamber by the entrance of the first round in the magazine. During this procedure, the control lever is not engaged in the camming slot on the control disk.

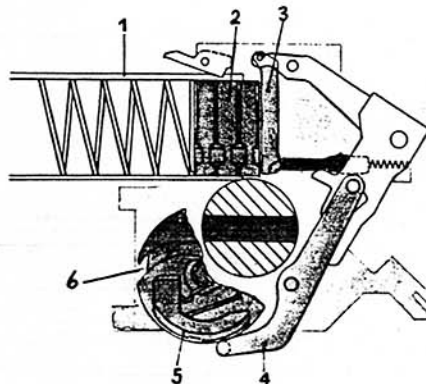


Figure #20

EJECTOR IN REARWARD POSITION.
ROUNDS ARE PRESENT IN THE MAGAZINE.

- | | |
|-------------|------------------|
| 1. Magazine | 4. Control lever |
| 2. Rounds | 5. Control disk |
| 3. Ejector | 6. Camming slot |

PRINCIPLE OF OPERATION (CONT)

If the magazine is empty or not in the weapon the ejector guide moves forward under pressure of a compression spring. The ejector is attached to the front portions of the ejector lever and is positioned by the ejector guide over the opening of the chamber (see figure #21 below).

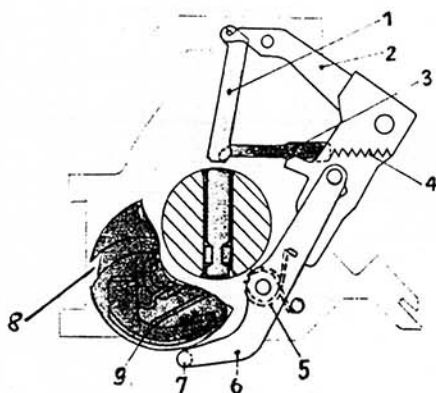


Figure #21

EJECTOR IN POSITION
TO ENTER THE CHAMBER

EJECTION SYSTEM

- | | |
|-----------------------|-------------------------|
| 1. Ejector | 5. Control lever spring |
| 2. Ejector lever | 6. Control lever |
| 3. Ejector guide | 7. Control lever bolt |
| 4. Compression spring | 8. Camming slot |
| | 9. Control disk |

By the pressure of the control lever spring, the bolt of the control lever is pushed against the edge of the control disk. If the cocking handle is manually rotated, the control disk is turned counter clockwise and the bolt on the control lever enters the camming slot in the control disk.

The upper bolt of the control lever pushes the ejector lever and the ejector downwards. Supported by the ejector guide, the ejector pushes the chambered round down and out of the ejection port (see figure #22).

PRINCIPLE OF OPERATION (CONT)

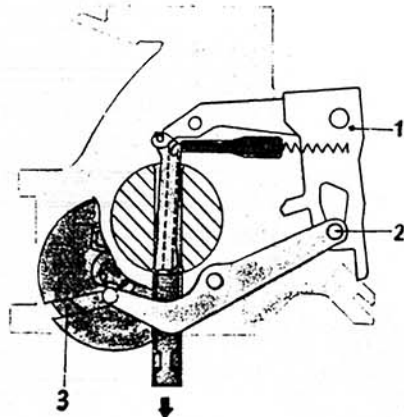


Figure #22






ROUND BEING EJECTED

1. Ejector lever
2. Upper control lever bolt
3. Camming slot





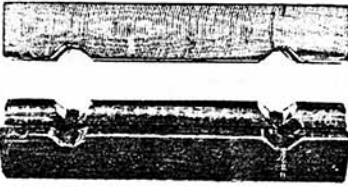

After ejection of the chambered round is complete, the ejector is pulled upwards and the breech cylinder is rotated 90° into firing position.

SPECIAL TOOLING AND SUPPORT EQUIPMENT


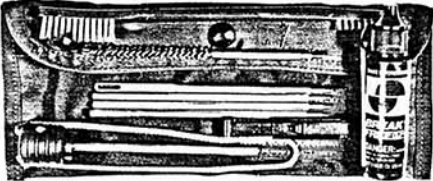


The tools and devices listed below are for use by authorized personnel only for armorers disassembly, reassembly, inspection, repair, and cleaning. For normal operators maintenance (cleaning and lubrication) the armorer must also possess the complete cleaning kit as pictured within the operators manual. The procedure for the use of the special tooling pictured below is contained elsewhere within this manual.

<u>ITEM</u>	<u>PHOTOGRAPH</u>	<u>USE</u>
Control disk wrench		Tool used to rotate breech cylinder and chamber when the weapon is disassembled
Optical sight wrench		Tool for removing and installing the locking ring that retains the optical sight within the carrying handle
Hammer, 100 g		For use in conjunction with punches for installing and removing roll pins
Screwdriver, flat head, large		Used for installing and removing large screws
Screwdriver, flat head, small 2.3 x 80		Used for installing and removing small screws

SPECIAL TOOLING AND SUPPORT EQUIPMENT (CONT)

ITEM	PHOTOGRAPH	USE
Tweezers		Tool for positioning and removing small parts and C-clips
Triangular file		Tool for removal of heavy lead deposits from weapon
Drift punch Ø 2.4 mm Ø 1.8 mm		Tool for installing and removing roll pins
Reamer		For use when removing heavy fouling from gas tube
Barrel vice blocks		Used to securely hold breech and barrel assembly in vice for maintenance purposes
Notched screwdriver		Used to engage and disengage springs, etc.

SPECIAL TOOLING AND SUPPORT EQUIPMENT (CONT)

ITEM	PHOTOGRAPH	USE
Assembly fixture for buffer		Used for assembly and disassembly of buffer assembly
Cleaning kit, HK-ACR 4.92 mm		For care and maintenance of the rifle
Petroleum jelly		Used to seal and lubricate various parts within weapon
Combination tool		Used for assembly, disassembly and cleaning

ARMORERS REASSEMBLY/DISASSEMBLY GENERAL INFORMATION

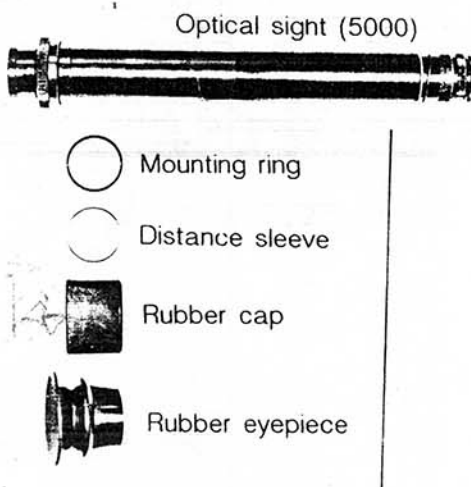
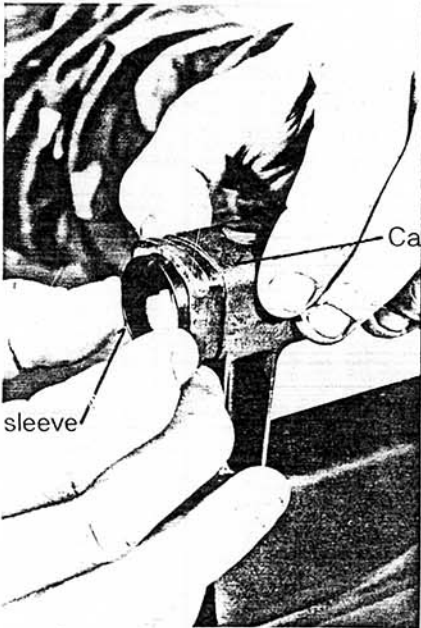
- o Unless otherwise directed, disassembly of parts and major groups is to be carried out in reverse order of reassembly.
- o These steps are subject to change due to technical modifications to the weapon.
- o Reassembly is shown by major groups in numerical order.
- o Read through the entire disassembly or reassembly procedure before attempting it.
- o After assembling a part or a series of parts, check for the appropriate function of that feature. Such as:
 - o Free movement of rotation
 - o No movement
 - o Presence of spring tension
 - o Proper positioning of alignment
 - o All parts are present
 - o All H-clips (holding clips), C-clips (circlips), roll pins, axles, screws and all other fasteners are properly positioned and secured.
- o As you assemble and disassemble the weapon, always look carefully at each component for any signs of damage such as:
 - o Excessive wear
 - o Cracks
 - o Burrs, dents, bends
 - o Rust
 - o Absence of protective finish

CAUTION: NEVER INSTALL THE BREECH AND BARREL ASSEMBLY INTO THE CENTER PART WITH THE HANDGUARD IN PLACE. THE B & BA RELEASE LEVER MAY NOT PROPERLY ENGAGE WITH THE B & BA IF INSTALLED AFTER THE HANDGUARD IS MOUNTED.

ARMORERS REASSEMBLY

ITEM(S): CENTER PART (1100)

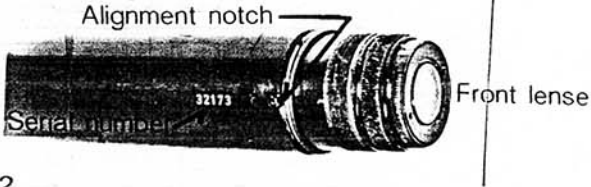
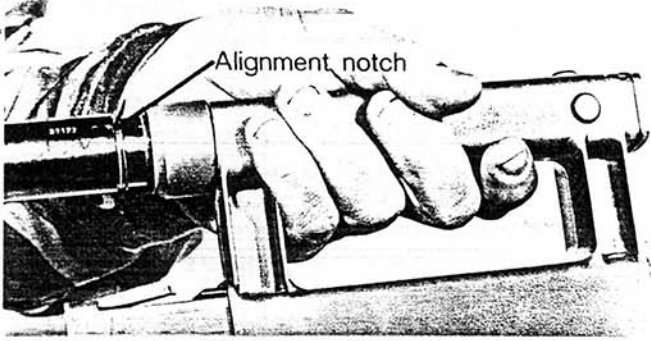

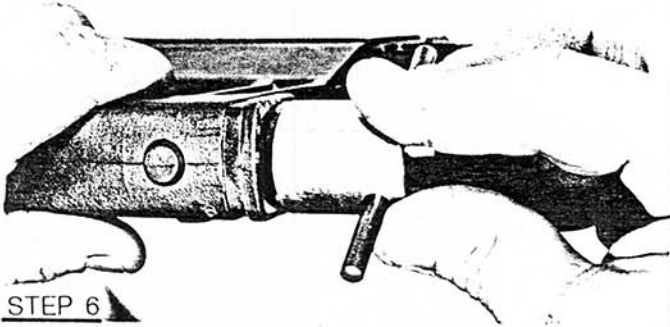
TOOLS REQUIRED: o OPTICAL SIGHT WRENCH

ACTION VIEW	REMARKS
<p data-bbox="178 576 392 607">OPTICAL SIGHT</p> <div data-bbox="250 628 721 1113">  <p data-bbox="423 637 666 668">Optical sight (5000)</p> <p data-bbox="388 777 548 808">Mounting ring</p> <p data-bbox="388 847 580 877">Distance sleeve</p> <p data-bbox="388 926 533 956">Rubber cap</p> <p data-bbox="388 1035 595 1065">Rubber eyepiece</p> </div> <div data-bbox="178 1166 871 1821"> <p data-bbox="470 1166 556 1196">FRONT</p>  <p data-bbox="680 1415 871 1445">Carrying handle</p> <p data-bbox="178 1603 370 1633">Distance sleeve</p> <p data-bbox="445 1834 533 1865">STEP 1</p> </div>	<ol style="list-style-type: none"> <li data-bbox="900 611 1433 707">1. Install the distance sleeve into the front of the carrying handle. <li data-bbox="900 738 1433 895">2. Find the alignment notch on the body of the optical sight located approximately 1 1/4" from the front lens near the serial number. <li data-bbox="900 926 1433 1122">3. Insert the optical sight into the rear opening of the carrying handle making sure that the alignment notch is held in about a 2 o'clock position. <li data-bbox="900 1153 1433 1480">4. Push the optical sight completely into the carrying handle until <ul style="list-style-type: none"> <li data-bbox="947 1284 1317 1314">o A loud click is heard <li data-bbox="947 1345 1056 1375">- and - <li data-bbox="947 1406 1433 1480">o The alignment detent has entered the alignment notch. <p data-bbox="947 1506 1433 1638">NOTE: ROTATING THE OPTICAL SIGHT BACK AND FORTH MAY HELP IN PROPERLY SEATING THE ALIGNMENT DETENT.</p> <p data-bbox="947 1668 1433 1852">NOTE: IF THE SIGHT CAN BE TURNED IN THE CARRYING HANDLE THE DETENT HAS NOT PROPERLY ENGAGED AND THE SIGHT MUST BE RE-POSITIONED.</p>

ARMORERS REASSEMBLY

ITEM(S): CENTER PART (1100)

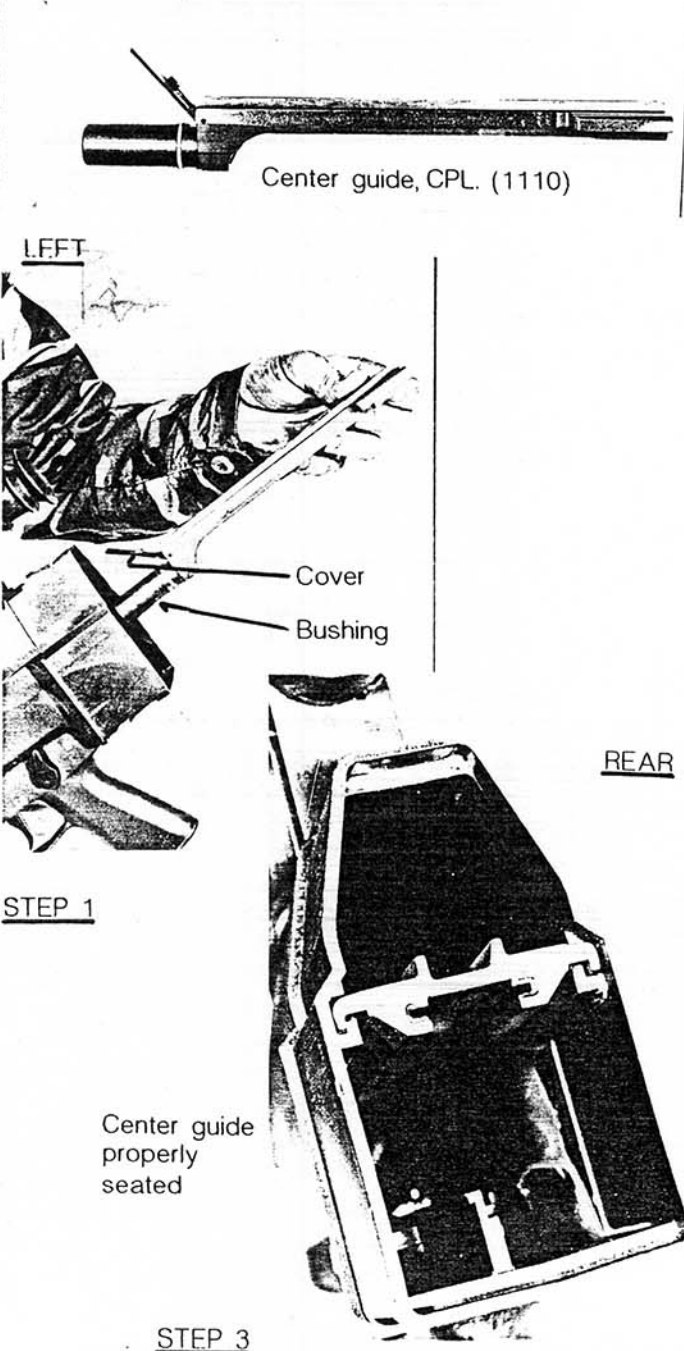
TOOLS REQUIRED: o OPTICAL SIGHT WRENCH

ACTION VIEW	REMARKS
<p><u>TOP</u></p> 	<p>5. Screw the mounting ring onto the front of the optical sight.</p> <p>NOTE: ENSURE THAT THE WRENCH NOTCHES FACE FORWARD.</p>
<p><u>STEP 2</u> <u>RIGHT</u></p> 	<p>6. Tighten the mounting ring with the sight wrench.</p> <p>CHECK FOR:</p> <ul style="list-style-type: none"> o NO ROTATION OF THE SIGHT WITHIN THE CARRYING HANDLE - and - o FREE ROTATION OF THE ELEVATION ADJUSTMENT KNOB.
<p><u>STEP 3 + 4</u> <u>FRONT</u></p> 	<p>7. Replace the front rubber cap and the rear rubber eyepiece.</p>
<p><u>STEP 5</u> <u>TOP</u></p> 	

ARMORERS REASSEMBLY (CONT)

ITEM(S): CENTER PART (1100)

TOOLS REQUIRED:

ACTION VIEW	REMARKS
<p data-bbox="178 572 376 602">CENTER GUIDE</p>  <p data-bbox="435 803 749 834">Center guide, CPL. (1110)</p> <p data-bbox="197 877 266 904">LEFT</p> <p data-bbox="470 1201 542 1227">Cover</p> <p data-bbox="470 1253 567 1279">Bushing</p> <p data-bbox="178 1533 272 1559">STEP 1</p> <p data-bbox="279 1751 435 1834">Center guide properly seated</p> <p data-bbox="332 1961 426 1987">STEP 3</p> <p data-bbox="780 1384 852 1410">REAR</p>	<ol style="list-style-type: none"> <li data-bbox="906 1122 1351 1279">1. Insert the bushing of the center guide into the opening for the barrel in the front of the center part. <li data-bbox="906 1314 1301 1380">Keep the magazine well cover pointing up. <li data-bbox="906 1415 1395 1729">2. Engage the rails on the rear of the center guide with the grooves in the center part. <li data-bbox="906 1576 1395 1729">3. Push the center guide fully into the center part until the rear of the center guide is recessed within the housing about 1/4". <p data-bbox="925 1764 1426 1978">NOTE: THE CENTER GUIDE IS HELD IN PLACE WITHIN THE CENTER PART BY FRICTION ONLY, BETWEEN THE GROOVES AS WELL AS BETWEEN THE BUSHING AND THE OPENING FOR THE BARREL.</p>

ARMORERS REASSEMBLY

ITEM(S): BUTT STOCK (1200)

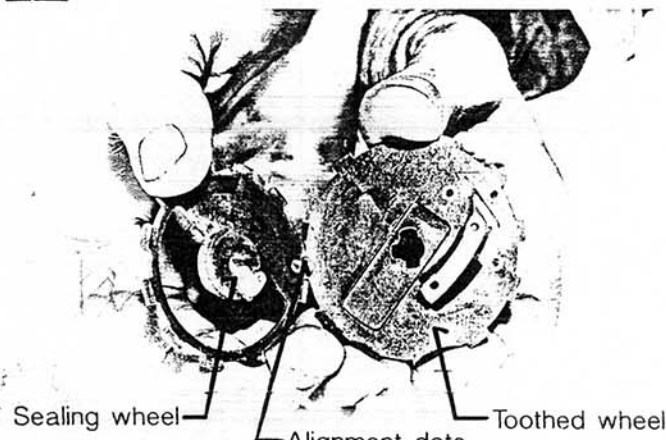


TOOLS REQUIRED: o FLAT HEAD SCREWDRIVER, SMALL
o PETROLEUM JELLY
o NOTCHED SCREWDRIVER

ACTION VIEW	REMARKS
<p>MAGAZINE RELEASE BUTTON</p> <div data-bbox="232 819 431 1015"> </div> <p>Magazine release button (1201)</p> <div data-bbox="305 1070 368 1146"> </div> <p>C-clip, medium (1200.1)</p>	<p>NOTE: BEFORE INSTALLING THE MAGAZINE RELEASE BUTTON OR THE COCKING MECHANISM, APPLY A THIN COATING OF PETROLEUM JELLY BETWEEN THE BUTT STOCK HOUSING AND THE OPERATING PART. WIPE OFF EXCESS AFTER ASSEMBLY IS COMPLETED.</p> <ol style="list-style-type: none"> 1. Insert magazine release button into the hole provided on the top of the butt stock. 2. Using the notched screw driver, attach a medium sized C-clip to the axle of the button on the inside of the butt stock.
<p>COCKING MECHANISM, CPL</p> <div data-bbox="227 1386 399 1561"> </div> <p>Sealing wheel (1220)</p> <div data-bbox="290 1561 337 1594"> </div> <p>H-clip, small (1200.12)</p> <div data-bbox="219 1594 415 1779"> </div> <p>Toothed wheel (1200.4)</p> <div data-bbox="235 1779 415 1954"> </div> <p>Cocking handle (1200.7) with cover (1200.5)</p> <div data-bbox="297 1976 352 2020"> </div> <p>H-clip, X-large (1200.3)</p>	

ARMORERS REASSEMBLY (CONT)

ITEM(S): BUTT STOCK (1200)

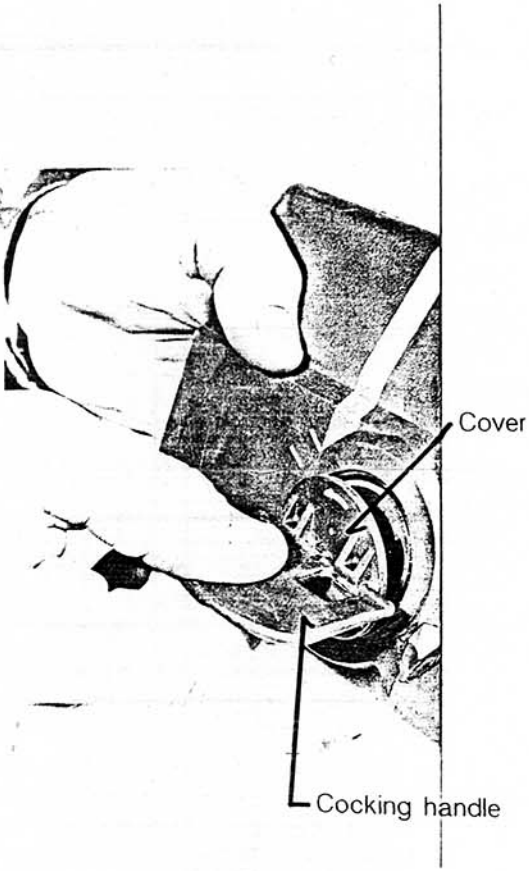
TOOLS REQUIRED: o FLAT HEAD SCREWDRIVER, SMALL
o PETROLEUM JELLY
o NOTCHED SCREWDRIVER

ACTION VIEW	REMARKS
<p><u>LEFT</u></p>  <p>Sealing wheel Alignment dots Toothed wheel</p> <p><u>STEP 1</u></p>	<ol style="list-style-type: none"> 1. Locate the alignment dots on both the toothed wheel and the sealing wheel. <p>These wheels must be assembled into the butt stock so that the alignment dots align as the cocking mechanism is actuated (turned).</p> <ol style="list-style-type: none"> 2. Slide the thinnest side of the sealing wheel into the butt stock and under the two permanently attached metal tabs riveted to the floor of the housing.
<p><u>REAR</u></p>  <p>Sealing wheel Metal tabs</p> <p><u>STEP 2 + 3</u></p>	<ol style="list-style-type: none"> 3. Push down on the sealing wheel to push its axle through the small hole in the bottom of the butt stock. 4. Attach a large H-clip to the axle of the sealing wheel to secure it to the butt stock. 5. Turn the sealing wheel so that the alignment dot is closest to left side of the housing and the ejection port is closed.
<p><u>REAR</u></p>  <p>Toothed wheel Alignment notches Sealing wheel</p> <p><u>STEP 5 + 6</u></p>	

ARMORERS REASSEMBLY (CONT)

ITEM(S): BUTT STOCK (1200)

TOOLS REQUIRED: o FLAT HEAD SCREWDRIVER, SMALL
o PETROLEUM JELLY
o NOTCHED SCREWDRIVER

ACTION VIEW	REMARKS
<p><u>LEFT</u></p>  <p><u>STEP 7</u></p>	<p>6. Install the toothed wheel making sure that it's alignment dot is next to the alignment dot of the sealing wheel.</p> <p>7. Push against the toothed wheel from the inside, install the axle of the cocking handle with cover into the hole of the toothed wheel.</p> <p>NOTE: IF THE TWO ALIGNMENT DOTS ON THE SEALING AND TOOTHED WHEELS ARE PROPERLY ALIGNED, THE WHITE ARROW ON THE COVER SHOULD BE AT A 12 O'CLOCK POSITION DURING ASSEMBLY.</p> <p>8. Attach an X-large H-clip to the axle of the cocking handle inside over the toothed wheel.</p> <p>CHECK FOR:</p> <ul style="list-style-type: none"> o FREE ROTATION OF THE ENTIRE COCKING MECHANISM. o THE AUTOMATIC STOP AFTER A 360° ROTATION OF THE COCKING HANDLE. o TWO H-CLIPS, ONE ON THE COCKING HANDLE AXLE AND THE OTHER ON THE AXLE OF THE SEALING WHEEL. o ALIGNMENT OF THE TWO ALIGNMENT DOTS.

ARMORERS REASSEMBLY

ITEM(S): BARREL & BREECH ASSEMBLY (2000)

TOOLS REQUIRED: o BUFFER ASSEMBLY
FIXTURE
o TWEEZERS
o NOTCHED SCREWDRIVER
o DRIFT PUNCH, Ø 2.4 mm

o BARREL VICE BLOCKS
o CONTROL DISK WRENCH
o HAMMER, 100 g
o FLAT HEAD SCREWDRIVER,
LARGE

ACTION VIEW

REMARKS

THREE ROUND BURST COUNTING MECHANISM



Plunger spring (2000.19)



Plunger (2000.18)



Counting wheel return lever
(2000.17)



Counting wheel spring (2000.16)



Counting wheel (2006)

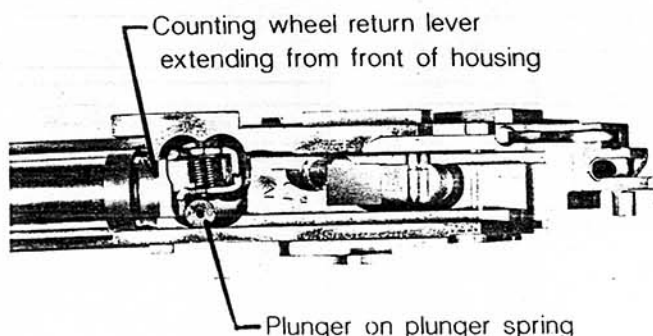


Return lever (2000.15)



H-Clip, small (2000.14)

BOTTOM



STEP 1 - 4

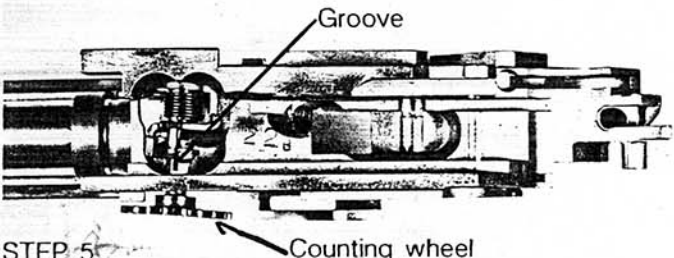
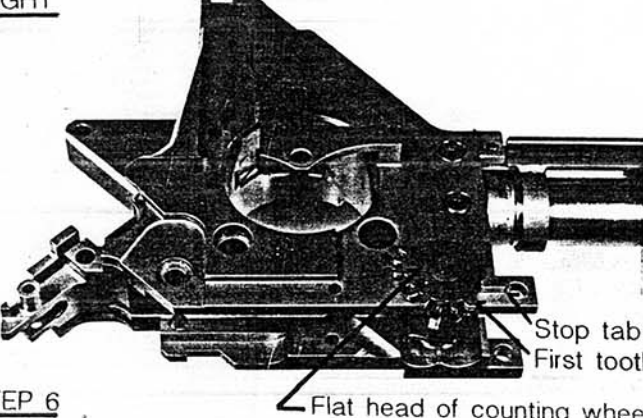
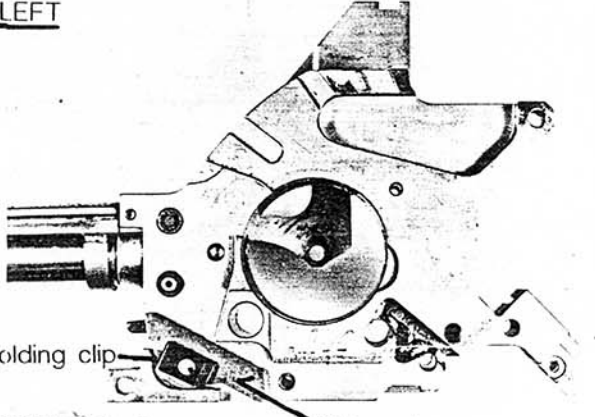
1. Place plunger spring into hole provided.
2. Place plunger over protruding end of plunger spring.
3. Position counting wheel return lever to the right of the plunger & spring.
4. Using the tweezers, position the counting wheel spring within the c.w. return lever. Ensure that the long extension of the c.w. spring is in the small hole to the right of the plunger.

ARMORERS REASSEMBLY (CONT)

ITEM(S): BARREL & BREECH ASSEMBLY (2000)

TOOLS REQUIRED: o BUFFER ASSEMBLY
FIXTURE
o TWEEZERS
o NOTCHED SCREWDRIVER
o DRIFT PUNCH, Ø 2.4 mm

o BARREL VICE BLOCKS
o CONTROL DISK WRENCH
o HAMMER, 100 g
o FLAT HEAD SCREWDRIVER,
LARGE

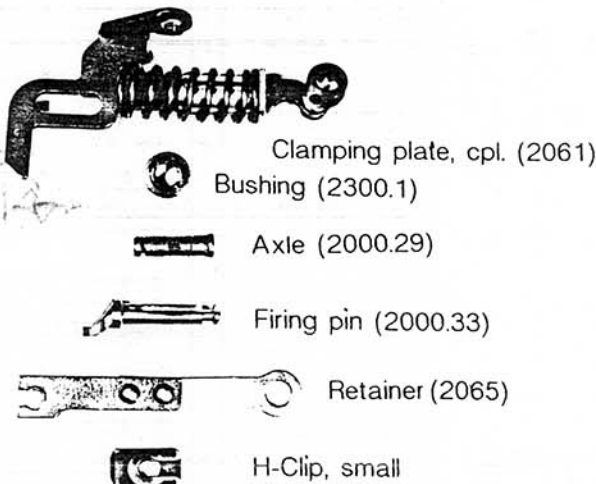
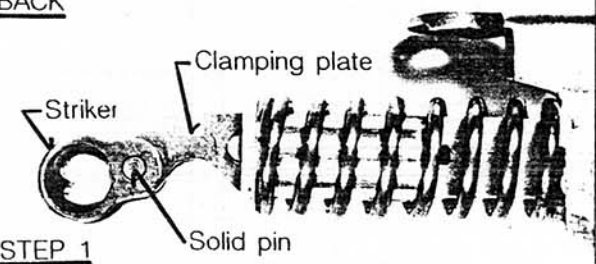
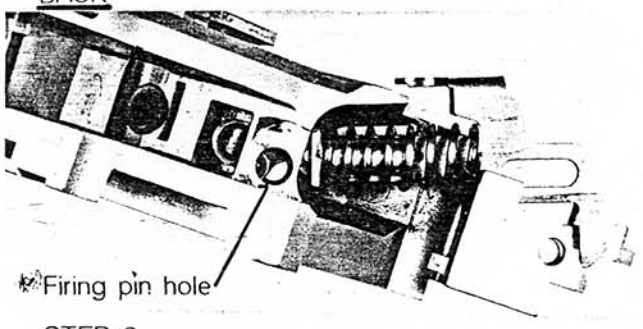
ACTION VIEW	REMARKS
<p><u>BOTTOM</u></p> 	<p>5. Hold the counting wheel with it's teeth pointing upwards. Slide the axle of the counting wheel from left to right over the plunger and through the c.w. return lever. Slowly rotate the counting wheel counter clockwise as you push it through the c.w. spring so that the short extension of the spring engages in the groove that runs along the axle of the counting wheel.</p>
<p><u>RIGHT</u></p> 	<p>6. The flat head of the counting wheel should be flush against the breech cylinder housing with the first tooth resting against the stop.</p> <p>7. Place the return lever over the axle of the counting wheel with it's longest leg facing the rear of the breech cylinder housing.</p>
<p><u>LEFT</u></p> 	<p>8. Secure the return lever and the counting wheel by attaching the small H-clip.</p>

ARMORERS REASSEMBLY (CONT)

ITEM(S): BARREL & BREECH ASSEMBLY (2000)

TOOLS REQUIRED:

- o BUFFER ASSEMBLY
- o FIXTURE
- o TWEEZERS
- o NOTCHED SCREWDRIVER
- o DRIFT PUNCH, Ø 2.4 mm
- o BARREL VICE BLOCKS
- o CONTROL DISK WRENCH
- o HAMMER, 100 g
- o FLAT HEAD SCREWDRIVER, LARGE

ACTION VIEW	REMARKS
<p>FIRING PIN ASSEMBLY</p>  <p>Clamping plate, cpl. (2061) Bushing (2300.1) Axle (2000.29) Firing pin (2000.33) Retainer (2065) H-Clip, small</p> <p><u>BACK</u></p>  <p><u>STEP 1</u></p> <p><u>BACK</u></p>  <p><u>STEP 2</u></p>	<ol style="list-style-type: none"> 1. Attach the striker to the clamping plate using the small solid pin. 2. Slide the clamping plate into position within the rear of the breech cylinder housing from right to left with the striker leading the way under the hole for the firing pin. (You may find it necessary to push up on the end of the compression spring to fully seat the clamping plate).

ARMORERS REASSEMBLY (CONT)

ITEM(S): BARREL & BREECH ASSEMBLY (2000)

TOOLS REQUIRED: o BUFFER ASSEMBLY
FIXTURE

o TWEEZERS

o NOTCHED SCREWDRIVER

o DRIFT PUNCH, Ø 2.4 mm

o BARREL VICE BLOCKS

o CONTROL DISK WRENCH

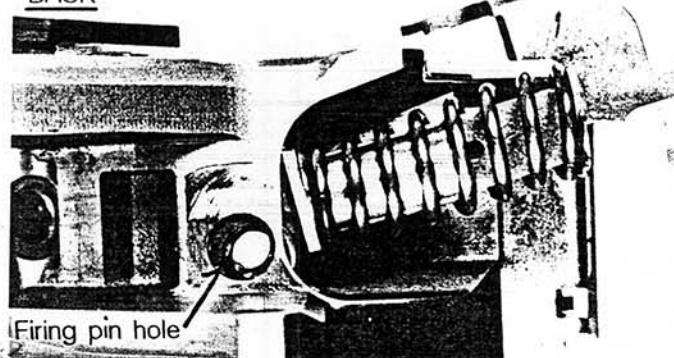
o HAMMER, 100 g

o FLAT HEAD SCREWDRIVER,
LARGE

ACTION VIEW

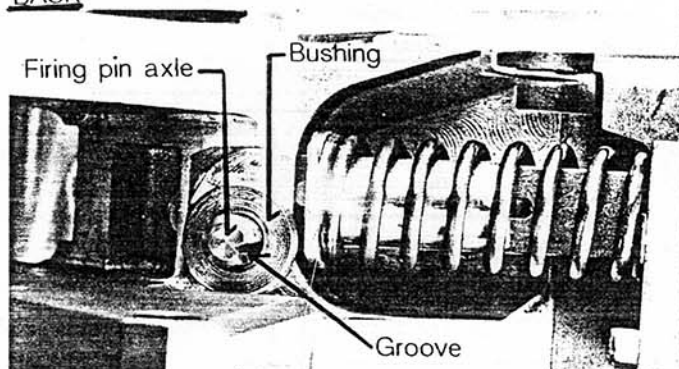
REMARKS

BACK



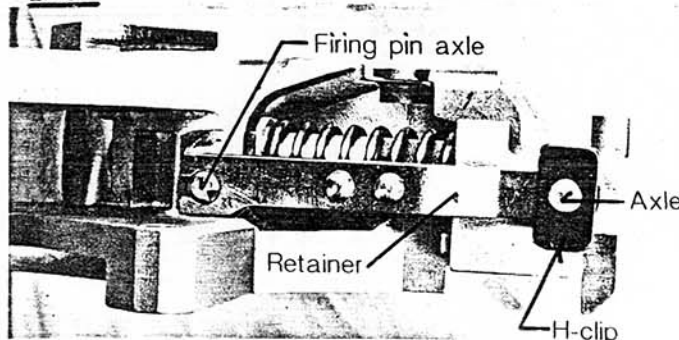
STEP 3

BACK



STEP 4

BACK



STEP 5 - 7

3. Position the bushing in the top of the hole for the firing pin.

4. Insert the axle portion of the firing pin through the firing pin hole from the opening for the breech cylinder towards the rear of the housing.

The largest groove in the firing pin axle must align with the wedge of the striker.

Slide the firing pin axle through the striker and the bushing.

5. Slide the axle from bottom to top through the hole provided in the bottom of the clamping plate.

6. Slide the open end of the retainer into the groove provided in the top of the firing pin axle.

Place the bottom of the retainer over the axle.

7. Secure the axle and retainer with a small H-clip.